STEREO CASSETTE DECK

KX-3010/3510

SERVICE MANUAL

KENWOOD

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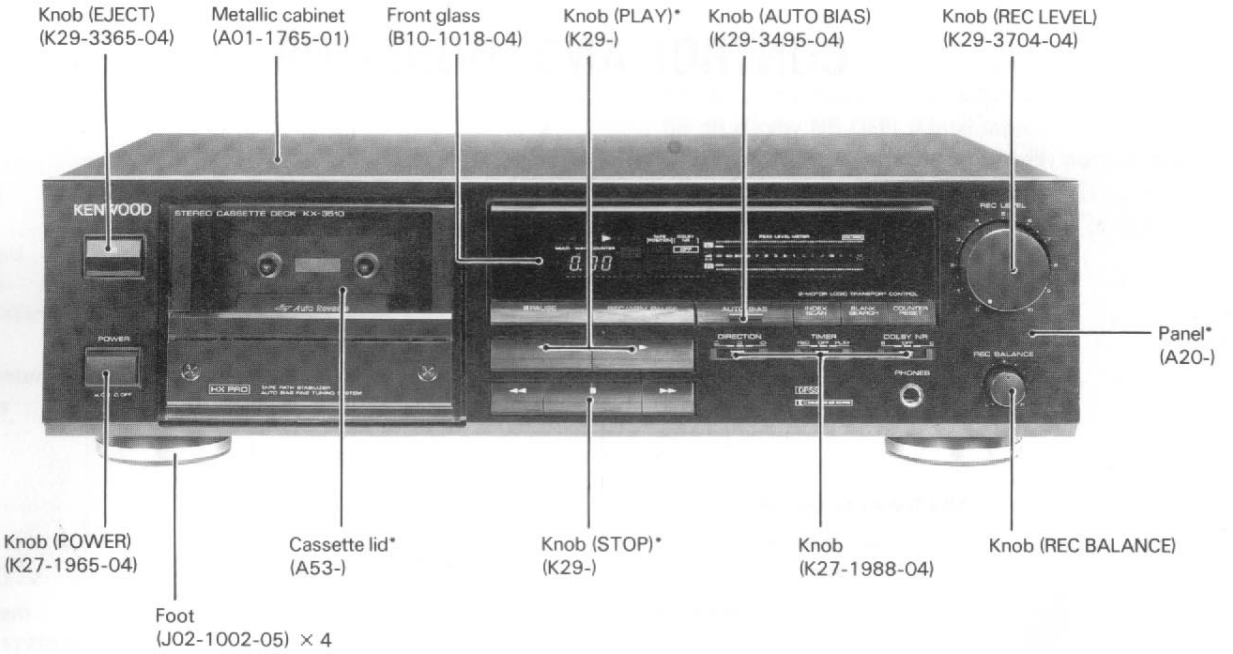
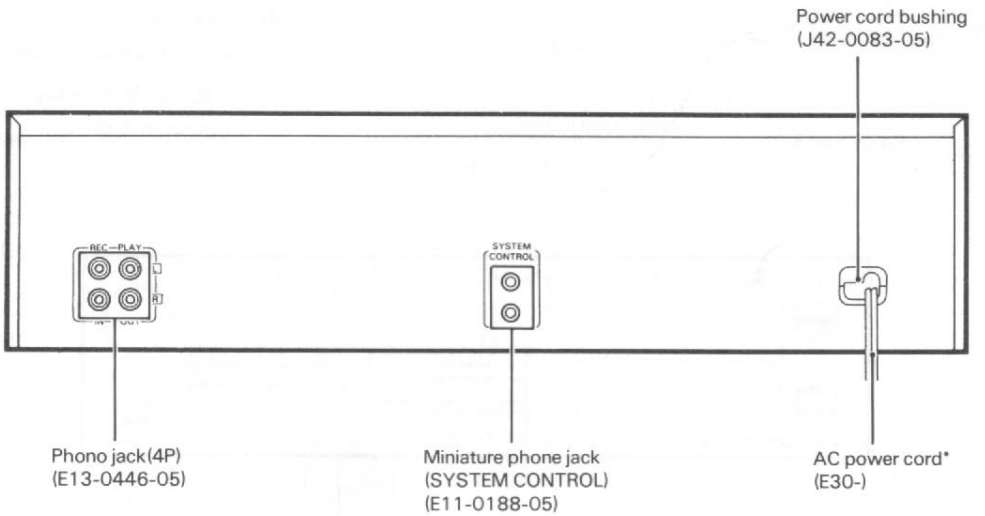
B51-3800-00(B)3021





KX-3010 is not provided with Auto Reverse Function. This description and drawings are based on the Auto Reverse Mechanism.

Shown above is KX-3510

***Refer to parts list on page 45.**

SPECIFICATIONS

KX-3010

Track system	4-Track, 2-channel stereo
Recording system	AC Bias System
Head	Record/play/erase × 1
Motor	× 1
Wow & flutter	0.08% (W.R.M.S.) ±0.18% (DIN)
Fast-winding time	Approx. 90 seconds (C-60)
Frequency response	
Normal tape:	30 ~ 16,000 Hz ±3 dB
CrO_2 tape:	30 ~ 17,000 Hz ±3 dB
Metal tape:	30 ~ 18,000 Hz ±3 dB
Signal-to-noise ratio	73 dB (Dolby C-type NR ON) (Metal tape) 66 dB (Dolby B-type NR ON) (Metal tape) 58 dB (Dolby NR OFF) (Metal tape)
Harmonic distortion	0.6% (at 1 kHz, 0 dB, 3rd H.D. with normal tape)
Input jacks	
LINE IN:	77.5 mV/50 kohms
Output jacks	
LINE OUT:	490 mV/2 kohms
Headphones:	3 mW/8 ohms
General	
Power consumption	23 W
Dimensions	W: 440 mm H: 127 mm D: 327 mm
Weight	4.8 kg (net)

KX-3510

Track system	4-track, 2-channel stereo
Recording system	AC Bias System
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Signal-to-noise ratio	73 dB (Dolby C-type NR ON) (Metal tape) 66 dB (Dolby B-type NR ON) (Metal tape) 58 dB (Dolby NR OFF) (Metal tape)
Harmonic distortion	0.8% (at 1 kHz, 0 dB, 3rd H.D. with normal tape)
Input jacks	
LINE IN	77.5 mV/50 kohms
Output jacks	
LINE OUT	490 mV/2 kohms
Headphones	3 mW/8 ohms
General	
Power consumption	23 W
Dimensions	W: 440 mm (17-5/16) H: 127 mm (5) D: 327 mm (12-7/8)
Weight	4.8 kg (10.6 lb) (net)

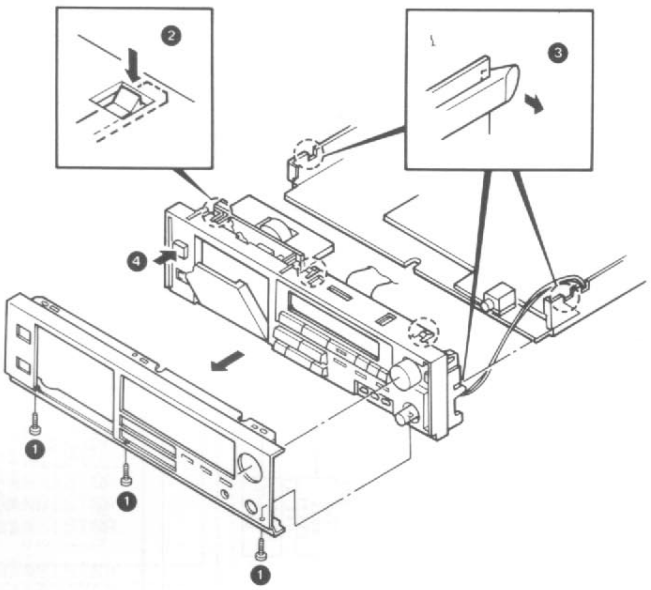
Note:

KENWOOD follows a policy of continuous advancements in development. For this reason specifications may be changed without notice.

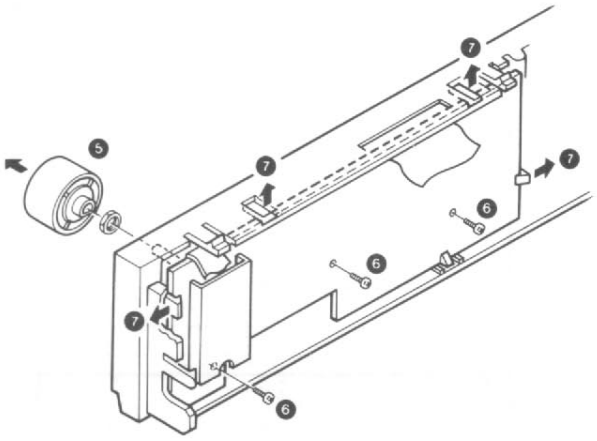
DISASSEMBLY FOR REPAIR

* Detach the case before hand.

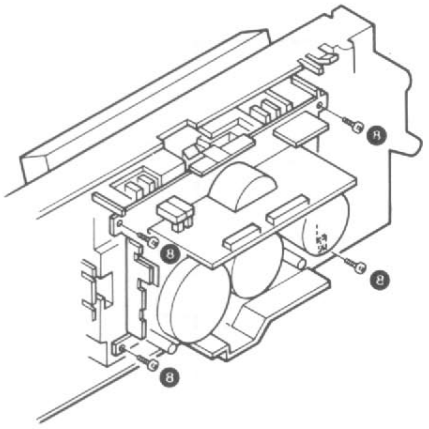
1. Remove the three screws ❶ Fixing the front panel.
2. Press the three claws ❷ on the upper side, press the two claws ❸ on the side, and take out the sub-panel.
3. Press the EJECT key ❹ , and open the cassette lid.



4. Take out the REC LEVEL Knob ❺ .
5. Remove the hexagonal nut of the REC LEVEL.
6. Remove the three screws ❻ .
7. Press the four claws ❼ on the sub-panel holding the DISPLAY unit (X25-358).

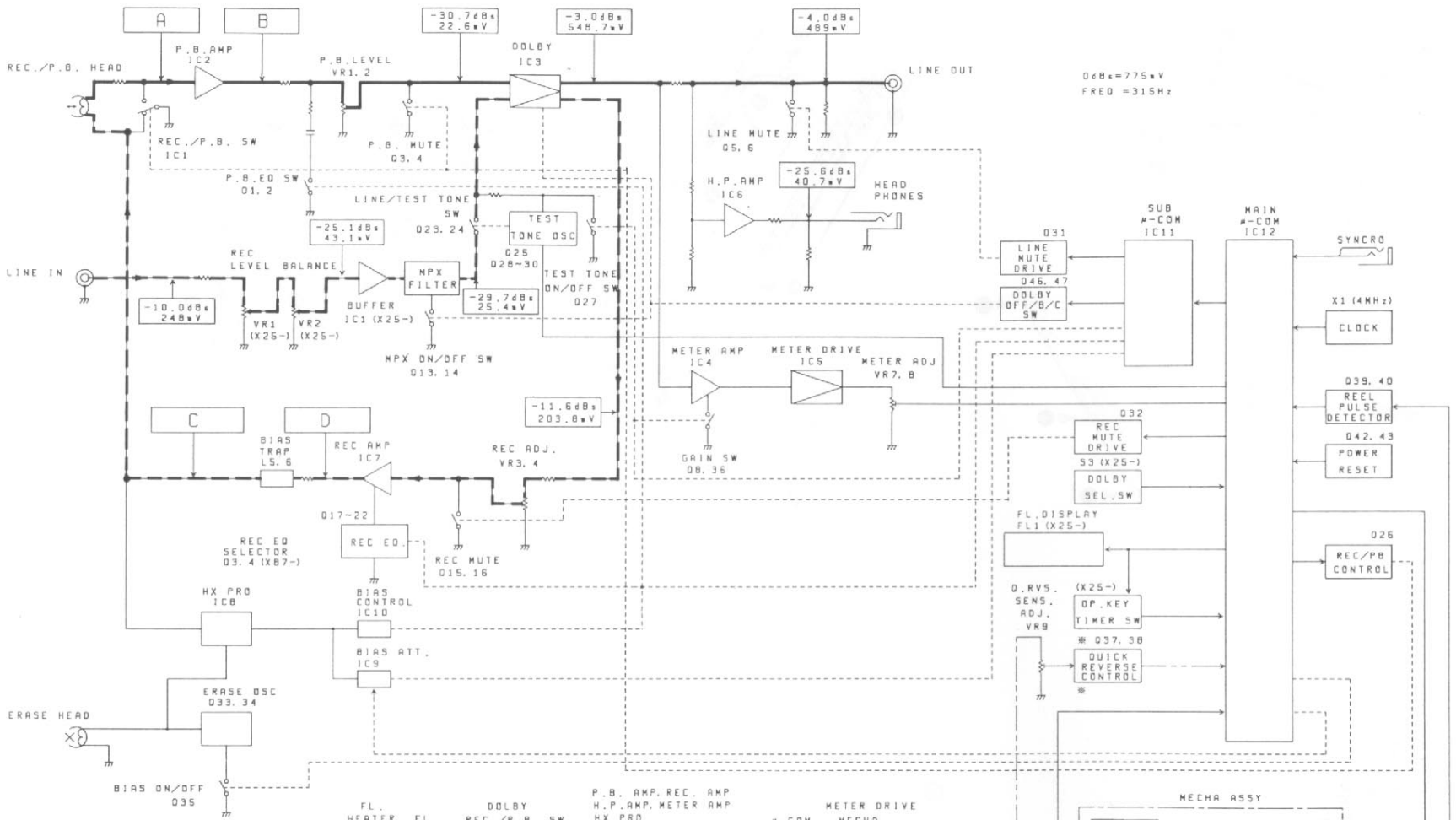


8. Remove the four screws ❽ and take out the mechanism ass'y.



KX-3010/3510

BLOCK LEVEL DIAGRAM



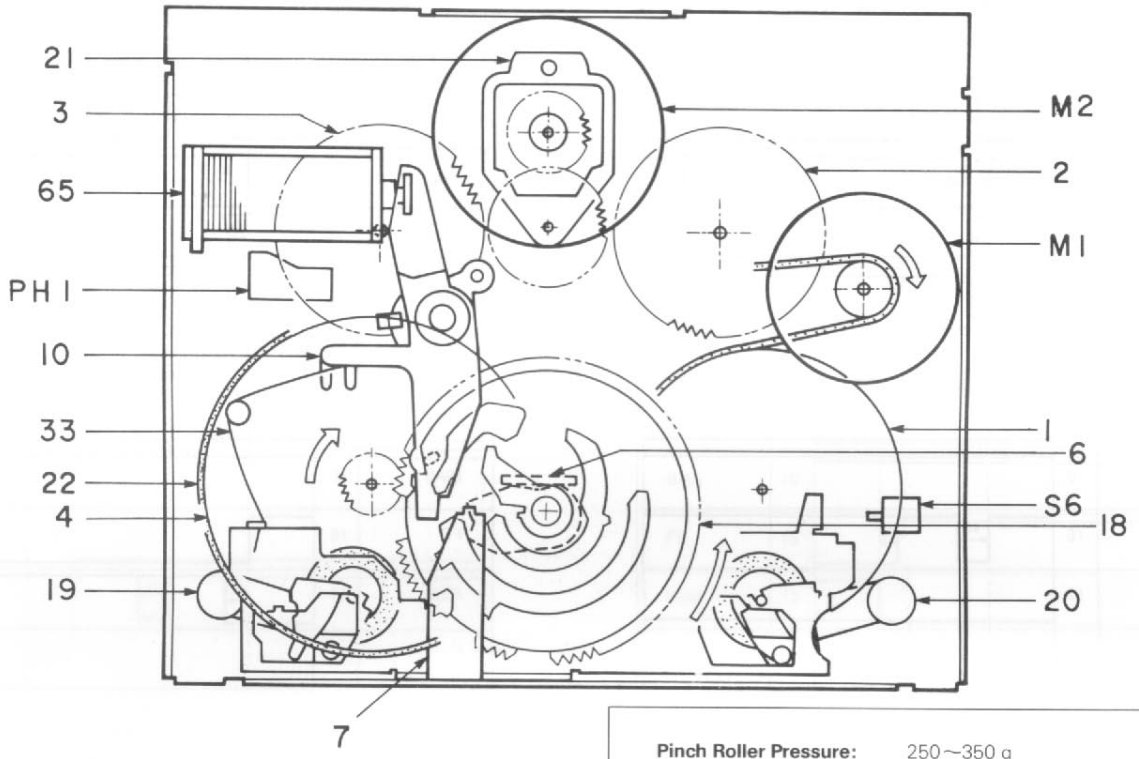
(NOTE) Q. RVS. SENS. ADJ. (VRS)
QUICK REVERSE CONTROL (Q37, 38)
KX-3510 only.

KX-3510(J)

		KX-3010	KX-3510
A		−67.8 dBs 0.316 mV	−66.2 dBs 0.380 mV
B		−24.7 dBs 45.1 mV	−25.1 dBs 43.1 mV
C	NORMAL	−31.5 dBs 20.6 mV	−28.9 dBs 27.8 mV
	CrO_2	−28.0 dBs 30.9 mV	−24.9 dBs 44.1 mV
	METAL	−27.0 dBs 34.6 mV	−24.4 dBs 46.7 mV
D	NORMAL	−30.5 dBs 23.1 mV	−28.3 dBs 29.8 mV
	CrO_2	−27.0 dBs 34.6 mV	−24.3 dBs 47.2 mV
	METAL	−26.0 dBs 38.8 mV	−23.8 dBs 50.0 mV

KX-3010/3510

MECHANISM OPERATION DESCRIPTION



Pinch Roller Pressure:	250~350 g
Take-up Torque:	30~70 g·cm (2.5 V)
FF. REW Torque:	90~180 g·cm (3.8 V)
Back Tension Torque:	2~6 g·cm

KX-3010 is not provided with Auto Reverse Function. This description and drawings are based on the Auto Reverse Mechanism.

STOP to FWD PLAY/REC Operation

Press the PLAY key.

Only in the STOP to REC mode, the REEL MOTOR rotates in the REW direction for 20 msec. to rewind the tape slightly.

By a signal from the microcomputer, the CAPSTAN MOTOR M1 rotates, and the SOLENOID (65) turns ON.

The PLAY ARM (10) swings in the direction of the arrow (➡ Ⓐ).

The pin Ⓑ of the PLAY ARM is released from the stopper section Ⓒ of the CAM GEAR (18).

The CAM GEAR rotates slightly and engages with the gear of the FLYWHEEL (4).

After a while, the SOLENOID turns OFF.

Since the SLIDER (7) is pushed by the torsion spring (33) in the direction of the arrow (➡), the protrusion swings along the orbit Ⓗ .

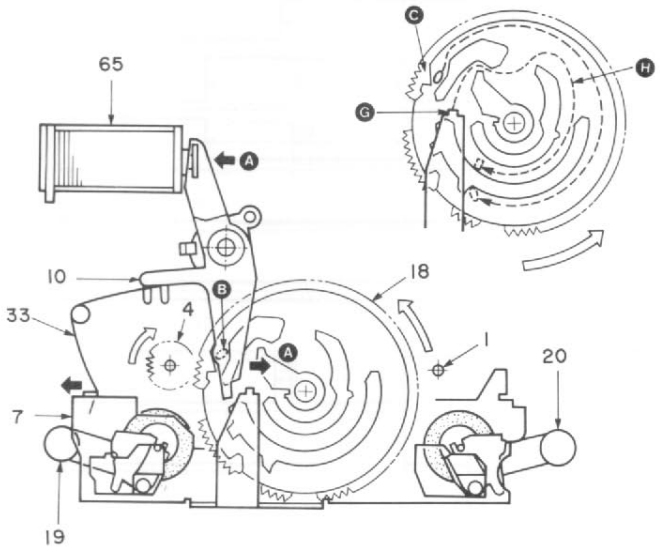


Fig. 2 STOP to FWD (forward) PLAY/REC operation

MECHANISM OPERATION DESCRIPTION

The bending section Ⓔ of the HEAD BASE (6) is lifted by the cam Ⓕ of the CAM GEAR and begins moving upward.

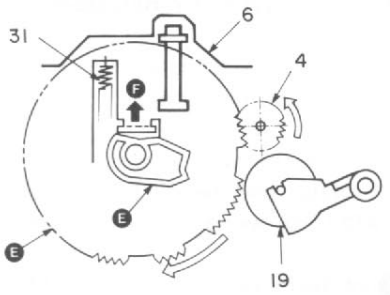


Fig. 3 (Front side view)

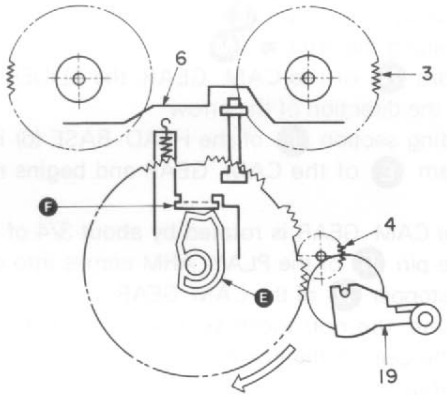


Fig. 4 STOP→PLAY/REC (Front side view)

When the CAM GEAR is rotated by about 3/4 of a revolution, the pin Ⓑ of the PLAY ARM comes into contact with the stopper Ⓓ of the CAM GEAR.
At this time, the non-tooth section of the CAM GEAR reaches the gear of the FLYWHEEL, and the CAM GEAR stops rotating.
When the HEAD BASE comes to the top end, the boss Ⓛ of the pinch roller (L) comes into contact with the edge Ⓙ of the SLIDER and it does not press the capstan.
Since the boss Ⓚ of the pinch roller (R) is inserted into the groove of the SLIDER, it is pressed to the capstan and the deck enters the FWD PLAY mode.

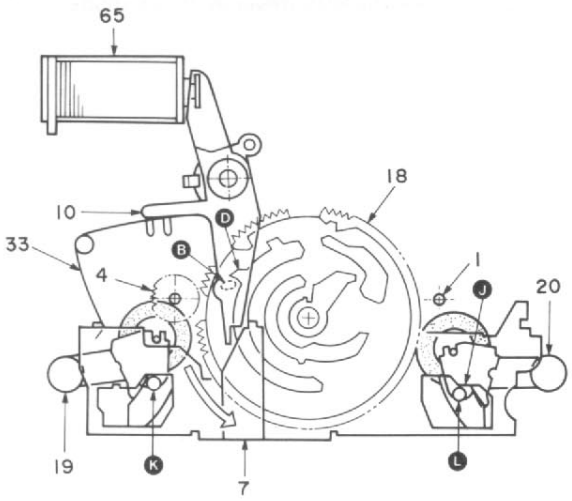


Fig. 5 FWD PLAY status

MECHANISM OPERATION DESCRIPTION

STOP to RVS (reverse) PLAY/REC Operation

Press the PLAY key.

Only in the STOP to REC mode, the REEL MOTOR rotates in the REW direction for 20 msec. to rewind the tape slightly.

By a signal from the microcomputer, the CAPSTAN MOTOR M1 rotates, and the SOLENOID (65) turns ON.

The PLAY ARM (10) swings in the direction of the arrow Ⓐ.

The pin Ⓑ of the PLAY ARM is released from the stopper section Ⓒ of the CAM GEAR (18).

The CAM GEAR rotates slightly and engages with the gear of the FLYWHEEL (4).

The SOLENOID turns OFF, and CAM GEAR is still rotating.

When the SOLENOID turns ON again, the protrusion Ⓖ is pushed by the edge Ⓛ of the PLAY ARM, and SWINGS along the orbit ➡ Ⓜ.

By the cam Ⓝ of the CAM GEAR, the SLIDER moves largely in the direction of the arrow

The bending section Ⓕ of the HEAD BASE (6) is lifted by the cam Ⓔ of the CAM GEAR and begins moving upward.

When the CAM GEAR is rotated by about 3/4 of a revolution, the pin Ⓑ of the PLAY ARM comes into contact with the stopper Ⓓ of the CAM GEAR.

At this time, the non-tooth section of the CAM GEAR reaches the gear of the FLYWHEEL, and the CAM GEAR stops rotating.

When the HEAD BASE comes to the top end, the boss Ⓚ of the pinch roller (R) comes into contact with the edge Ⓙ of the SLIDER and it does not press the capstan.

Since the boss Ⓙ of the pinch roller (L) is inseted into the groove of the SLIDER, it is pressed to the capstan and the deck enters the RVS (reverse) PLAY mode.

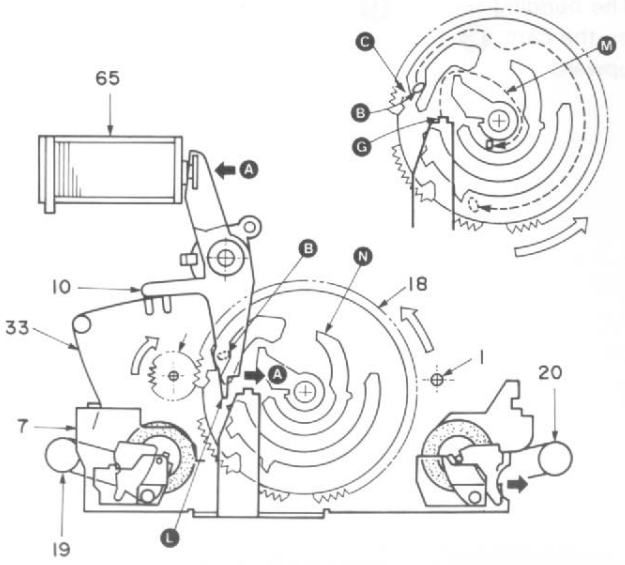


Fig. 6 STOP to RVS PLAY/REC operation

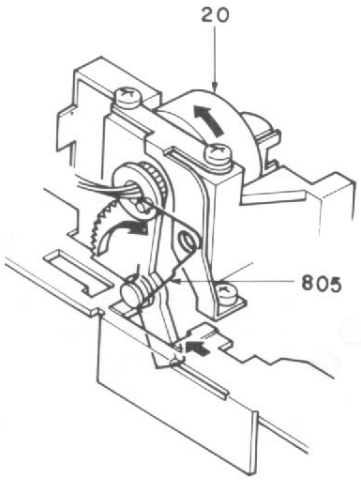


Fig. 7 Head selection (FWD to RVS)

MECHANISM OPERATION DESCRIPTION

FWD (forward) PLAY/REC to STOP Operation

Press the STOP key.

By a signal from the microcomputer, the SOLENOID (65) turns OFF.

The PLAY ARM (10) is swung in the direction of the arrow ⬅ Ⓐ by the TORSION SPRING (33), and the pin Ⓑ is released from the stopper Ⓓ.

The CAM GEAR is slightly rotated by the HEAD BASE in the direction of the arrow

The CAM GEAR is engaged with the gear of the FLY-WHEEL (4) and continues rotating.

The protrusion Ⓖ of the SLIDER (7) passes through the orbit ⇢ Ⓟ.

When the pin Ⓑ of the PLAY ARM comes into contact with the stopperr Ⓒ of the CAM GEAR, the CAM GEAR stops rotating.

By the signal from the microcomputer, the CAPSTAN MOTOR stops and the deck enters the stop mode.

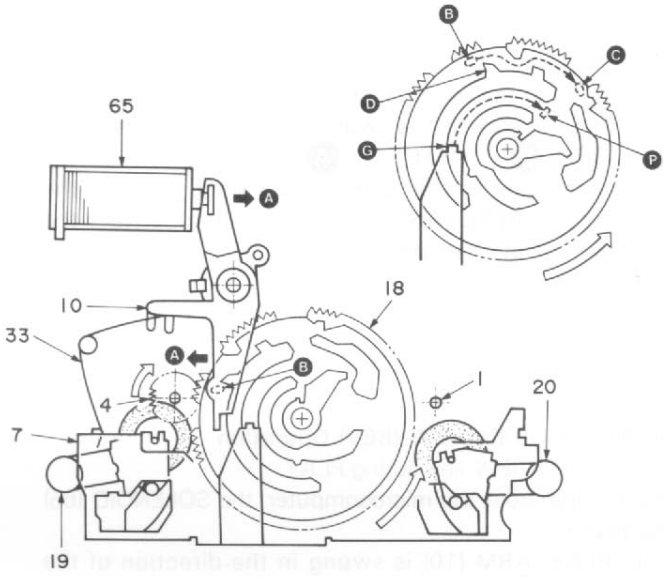


Fig. 8 FWD PLAY/REC to STOP operation

RVS (reverse) PLAY/REC to STOP Operation

Press the STOP key.

By a signal from the microcomputer, the SOLENOID (65) turns OFF.

The PLAY ARM (10) is swung in the direction of the arrow ⬅ Ⓐ by the TORSION SPRING (33), and the pin Ⓑ is released from the stopper Ⓓ.

The CAM GEAR is slightly rotated by the HEAD BASE in the direction of the arrow ⇨.

The CAM GEAR is engaged with the gear of the FLY-WHEEL (4) and continues rotating.

The protrusion Ⓖ of the SLIDER (7) passes through the orbit ⇢ Ⓠ.

When the pin Ⓑ of the PLAY ARM comes into contact with the stopper Ⓒ of the CAM GEAR, the CAM GEAR stops rotating.

By the signal from the microcomputer, the CAPSTAN MOTOR stops and the deck enters the stop mode.

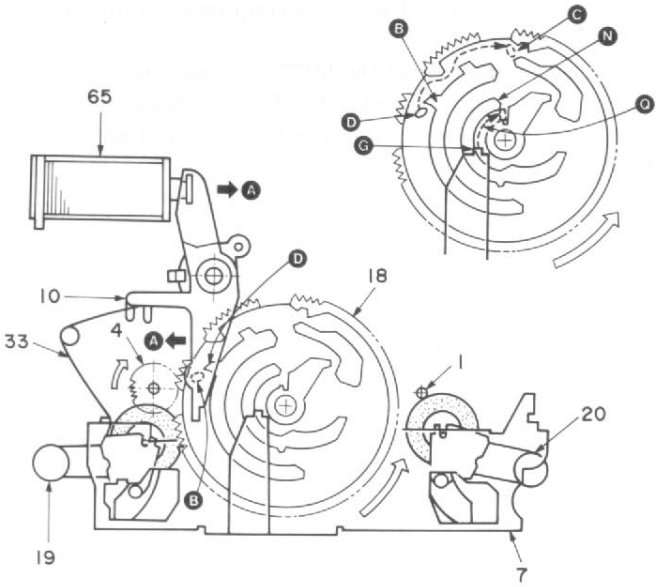


Fig. 9 RVS PLAY/REC to STOP operation

MECHANISM OPERATION DESCRIPTION

STOP to FF/REW Operation

By a signal from the microcomputer, the SOLENOID (65) turns ON. At the same time, the REEL MOTOR M2 starts rotating in the appropiate direction. (REW: CW ⇦, FF: ⇨ CCW)

According to the rotating direction of the REEL MOTOR, the IDLER ASS'Y (21) is swung in the appropriate direction. (REW: Ⓑ ⇦, FF: ⇨ Ⓐ)

When the gear of the IDLER ASS'Y engages with the gear of the REEL ASS'Y (2, 3), the deck enters the FF/REW operation mode.

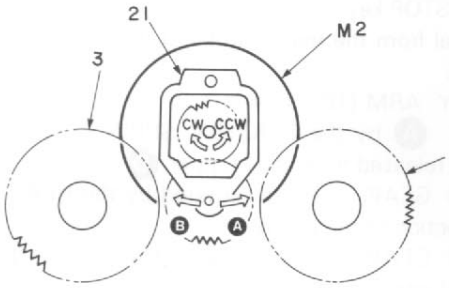


Fig. 10 (FRONT SIDE VIEW)

PLAY to CUE/REVIEW (REV) Operation

Press the FF/REW key during PLAY.

By a signal from the microcomputer, the SOLENOID (65) turns OFF.

The PLAY ARM (10) is swung in the direction of the arrow ⬅ Ⓐ by the TORSION SPRING (33), and the pin Ⓑ is released from the stopper Ⓓ.

After approx. 40 msec., the SOLENOID is turned ON again.

The pin Ⓑ of the PLAY ARM passed by the internal orbit, and then comes into contact with the stopper Ⓒ of the CAM GEAR.

At this time, the non-tooth section of the CAM GEAR comes to the gear of the FLYWHEEL, and the CAM GEAR stops rotating at the position where the HEAD BASE (6) is lowered slightly to that position.

The PINCH ROLLER (19, 20) is released from the CAPSTAN in accompanied with lowering movement of the HEAD BASE.

After a while, the CAPSTAN MOTOR stops rotating, and at the same time, the REEL MOTOR rotates in the appropriate direction to activate the CUE and REVIEW (REV) operations.

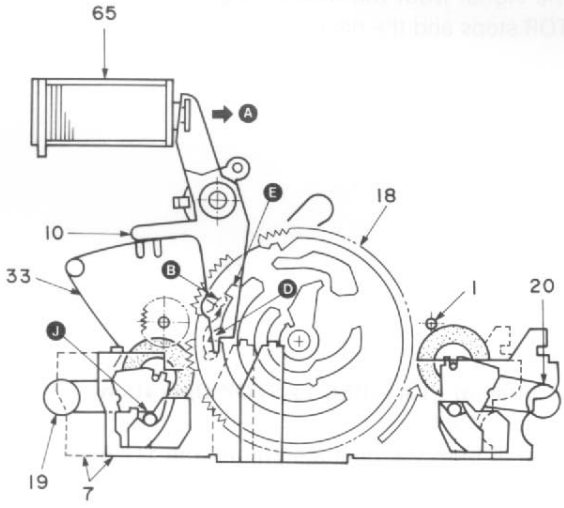


Fig. 11 PLAY to CUE/REV operation

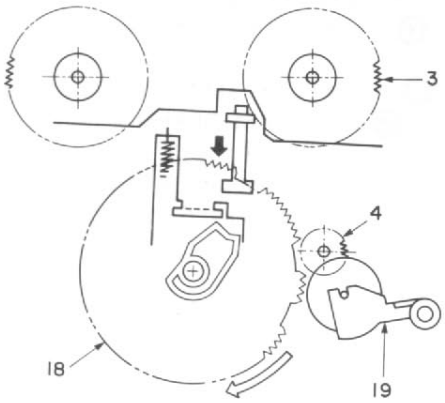
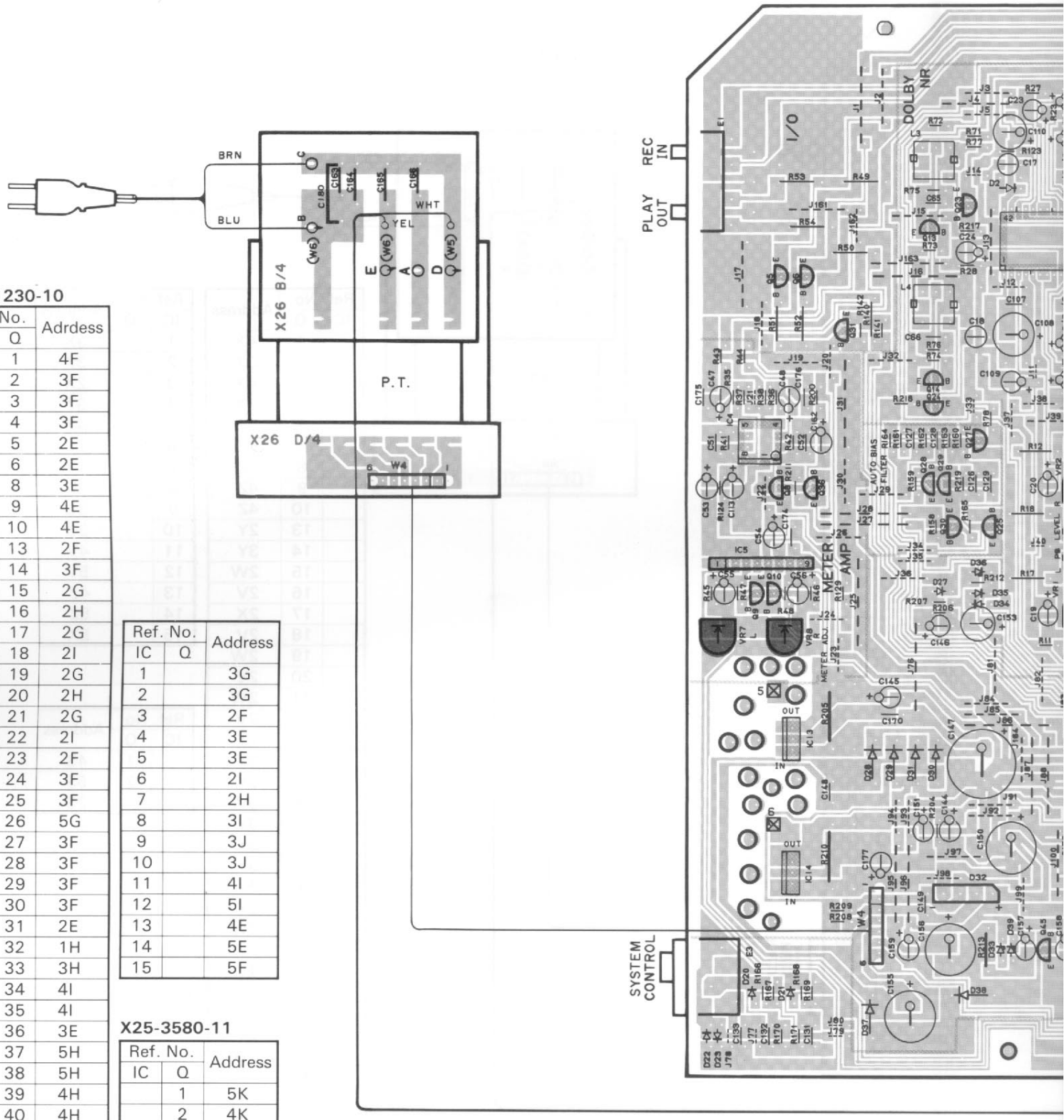


Fig. 12 CUE/REV status (Front side view)

ADJUSTMENT

No.	ITEM	INPUT SETTINGS	OUTPUT SETTINGS	CASSETTE TAPE DECK SETTINGS	ALIGNMENT POINTS	ALIGN FOR	FIG.
Unless otherwise specified; each switch sould be set as follows: TAPE: NORMAL, DOLBY,: OFF, INPUT: LINE						0 dBs = 0.775 V	
I. Cassette mechanism section (REC/PB head adjustment)							
[1]	Demagnetization and cleaning	—	—	Power OFF, demagnetization, cleaning play	REC/PB head, erase head, capstan, pinch roller	Demagnetize the REC/PB head by head eraser. Clean the REC/PB head, erase head, capstan and pinch roller with a cotton swab immersed in alcohol.	
[2]	REC/PB head azimuth	MTT-114, TCC-153 10 kHz, −10 dB	(B)	PLAY	Azimuth adjustment screw	In a setting where the output is maximized, adjust the azimuth adjustment screw so that the Lissajous figure appearing on the oscilloscope screen comes near to a line slanted 45°. Note: The head should be installed in such a manner that it approaches the tape face.	(a)
[3]	Tape speed	MTT-111, TCC-100 3 kHz, −4 dB	(B)	PLAY	Semi-fixed resistor in DC motor assembly	Adjust so that frequency is 3 kHz at the center of the tape.	(b)
II. PC board adjustment (X26-1230-10)							
<1>	Playback level	MTT-150 400 Hz	(B)	PLAY	VR1 (L) VR2 (R)	Adjust so that LINE OUT is −1.2 dBs.	
		MTT-256 315 Hz				Adjust so that LINE OUT is −4.0 dBs.	
		MTT-256U, TCC-160 315 Hz				Adjust so that LINE OUT is 0 dBs.	
<2>	Bias current	(A) 1kHz, −30 dBs 10 kHz, −30 dBs	(B)	Adjust the REC VR (LEVEL, BALANCE) so that the REC monitor output is −24 dBs at 1 kHz, and record and playback 1 kHz and 10 kHz alternately.	VR5(L) VR6(R)	Record 1 kHz and 10 kHz alternately, and adjust each bias current adjustment VR so that the 10 kHz play back level is +0.5 dBs against 1 kHz.	
<3>	Recording level	(A) 1 kHz, −30 dBs	(B)	With the situation in above item <2> is kept as it is, record and play back 1 kHz.	VR3(L) VR4(R)	Adjust so that the playback output level is −24 dBs.	
<4>	FL meter 0 dB	(A) 1 kHz, −10 dBs	—	Adjust the REC VR (LEVEL, BALANCE) so that the REC PAUSE monitor output is −4 dBs at 1 kHz.	VR7(L) VR8(R)	Adjust so that "0 dB" lights.	
<5>	Quick reverse sensitivity	Use the leader tape section of the test tape.		PLAY	VR9	With a DC voltmeter connected to TP5, adjust so that 2.5 V appears.	(c)
Note: On item <1> in "II. PC board adjustment"							
Although 3 kinds of tapes are set forth for the playback level adjustment, the use of one tape suffices for adjustment. Here is meant no necessity for the use of all these 3 kinds of tapes. Other than the abovementioned tapes, when a test tape equal in magnetic flux and frequency is available, the adjustment is feasible with this test tape by making the playback output suited to the specified output level of this tape in agreement with the adjustment method.							

PC BOARD (Component Side View)



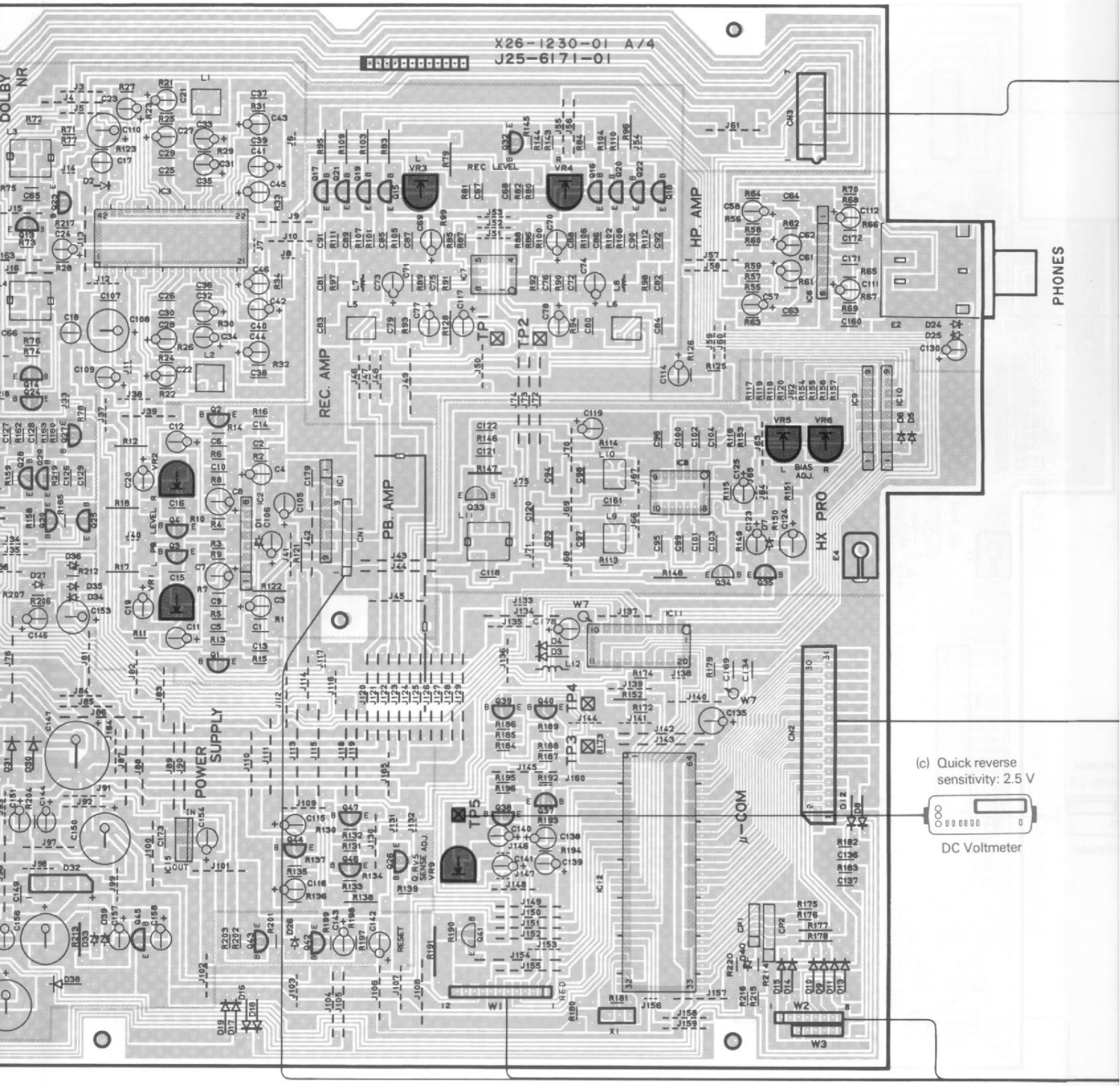
X26-1230-10

Ref. No.		Adrdess
IC	Q	
	1	4F
	2	3F
	3	3F
	4	3F
	5	2E
	6	2E
	8	3E
	9	4E
	10	4E
	13	2F
	14	3F
	15	2G
	16	2H
	17	2G
	18	2I
	19	2G
	20	2H
	21	2G
	22	2I
	23	2F
	24	3F
	25	3F
	26	5G
	27	3F
	28	3F
	29	3F
	30	3F
	31	2E
	32	1H
	33	3H
	34	4I
	35	4I
	36	3E
	37	5H
	38	5H
	39	4H
	40	4H
	41	5H
	42	5G
	43	5G
	44	5G
	45	5F
	46	5G
	47	5G

Ref. No.		Address
IC	Q	
1		3G
2		3G
3		2F
4		3E
5		3E
6		2I
7		2H
8		3I
9		3J
10		3J
11		4I
12		5I
13		4E
14		5E
15		5F

X25-3580-11

Ref. No.		Address
IC	Q	
	1	5K
	2	4K
1		1L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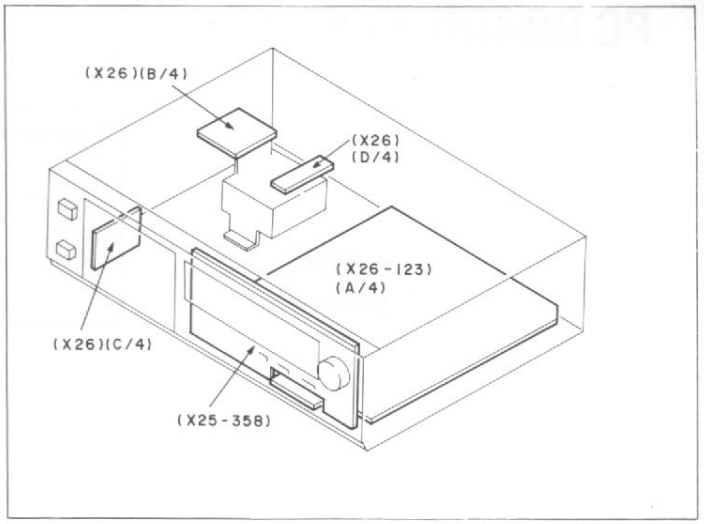
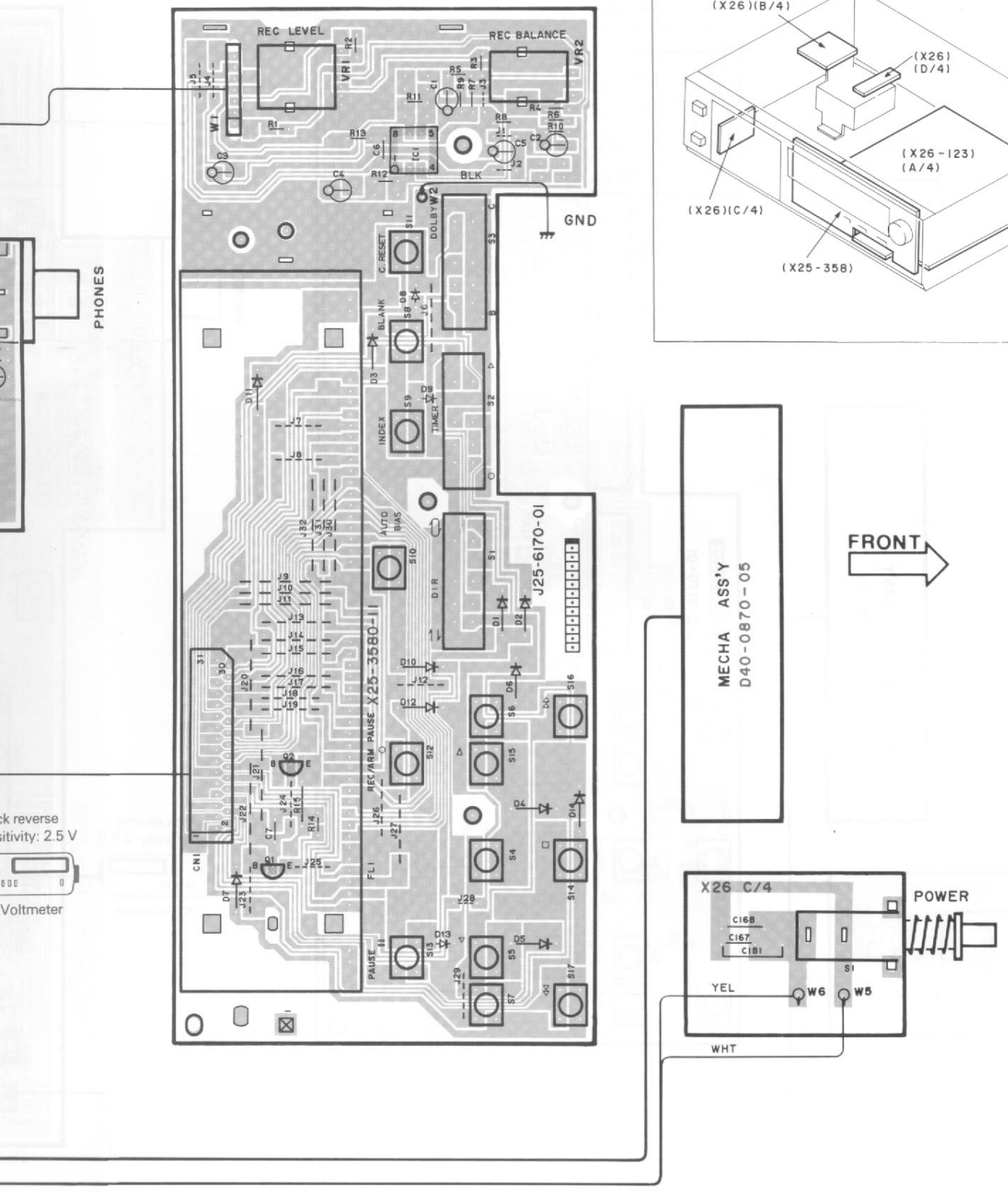
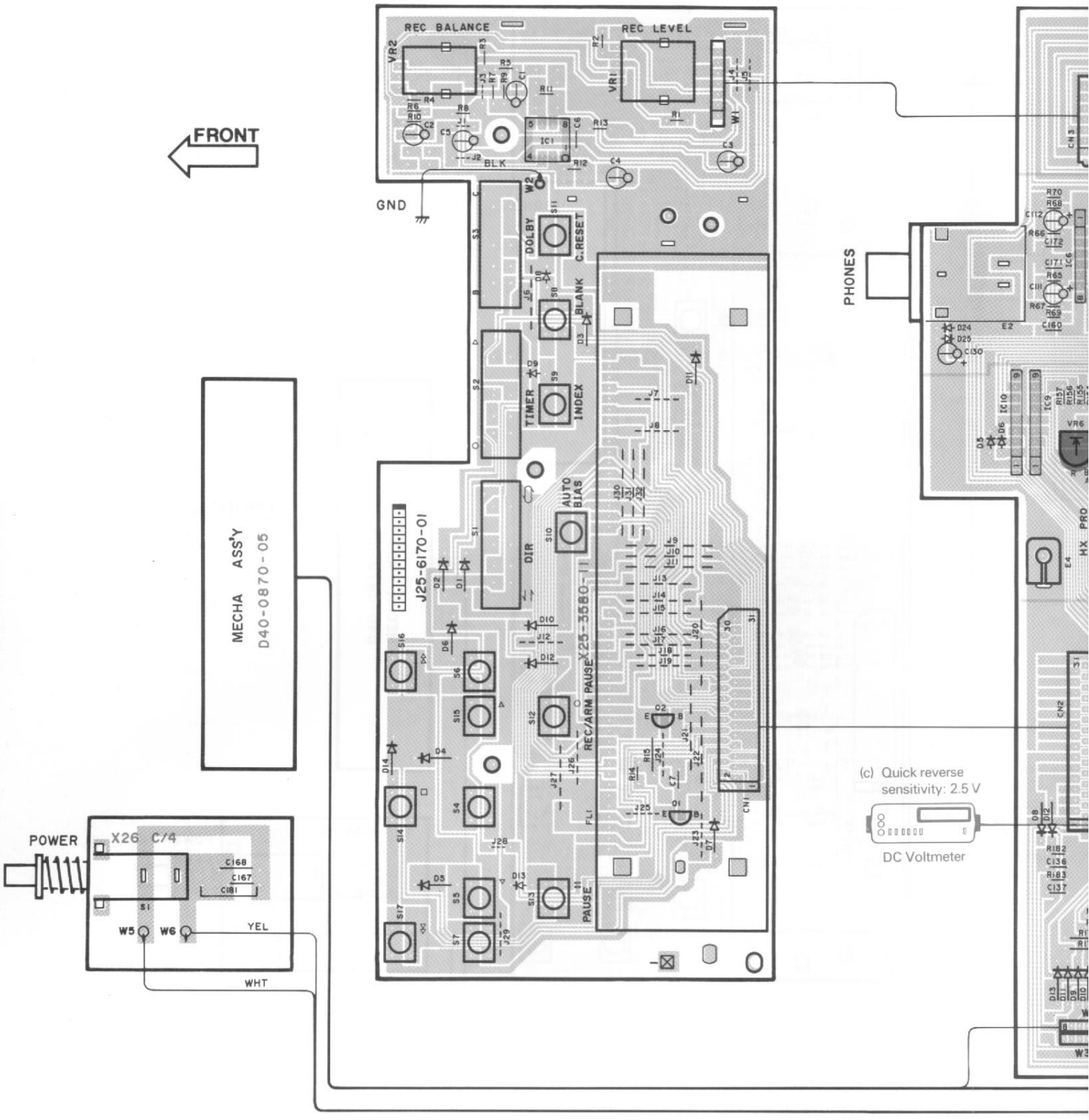
J25-6171-01
DOLBY NR
REC. AMP
PB. AMP
POWER SUPPLY
HP. AMP
HX PRO
μ-COM
PHONES
REC LEVEL
PB LEVEL
BIAS ADJ.
TP1
TP2
TP3
TP4
TP5
(c) Quick reverse sensitivity: 2.5 V
DC Voltmeter



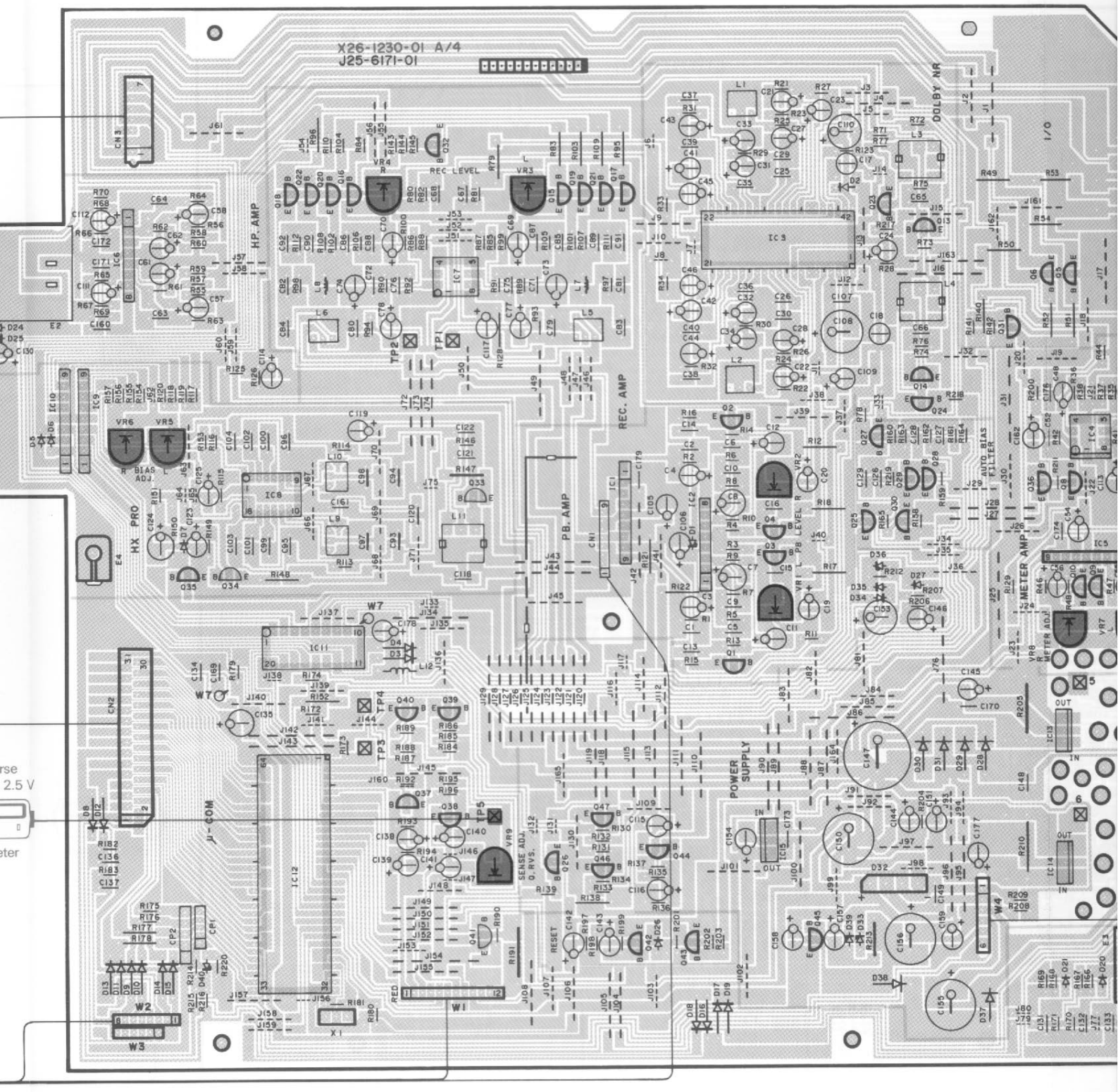


Refer to the schematic diagram for the values of resistors and capacitors.

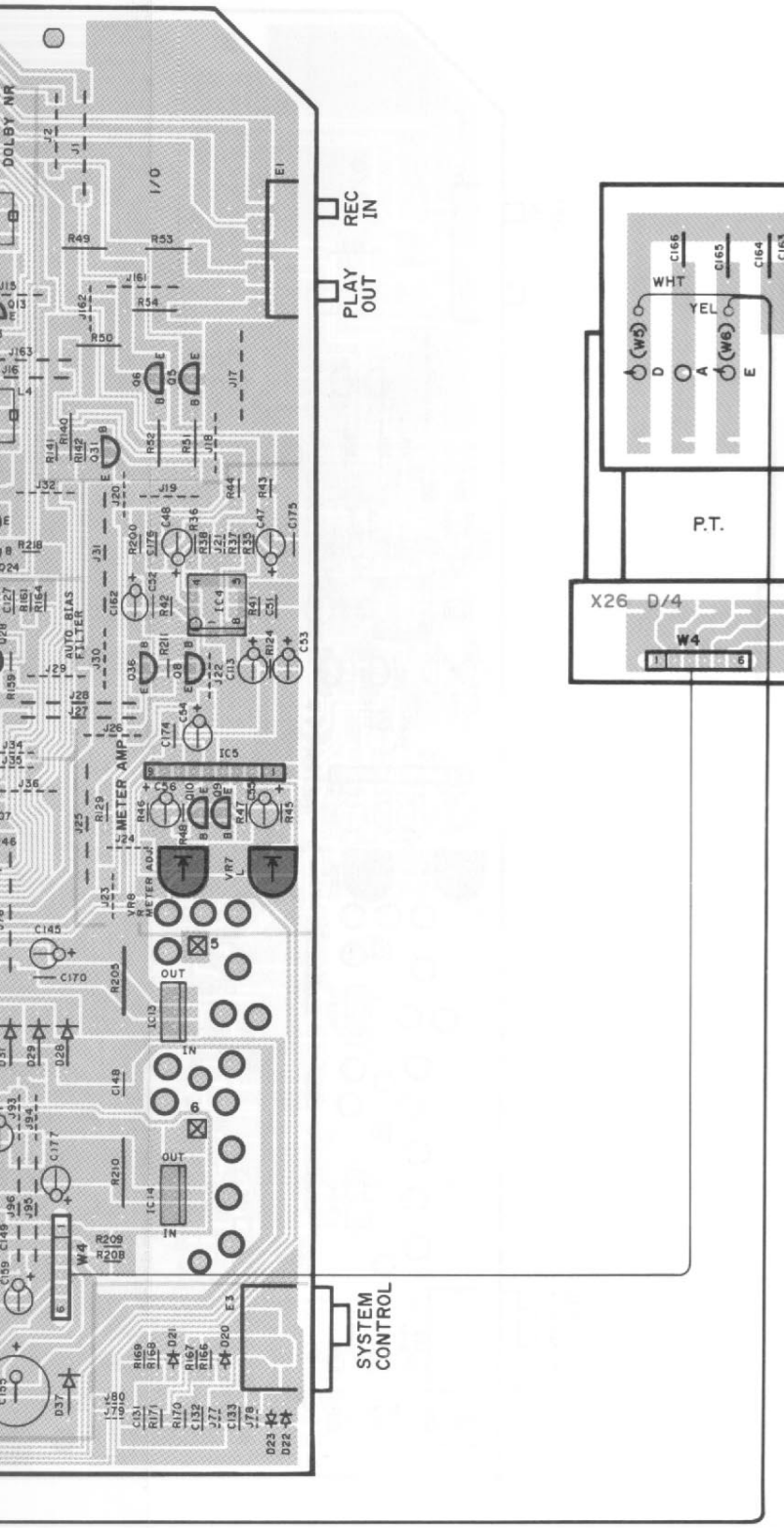
PC BOARD (Foil Side View)



U V W X Y



Refer to the



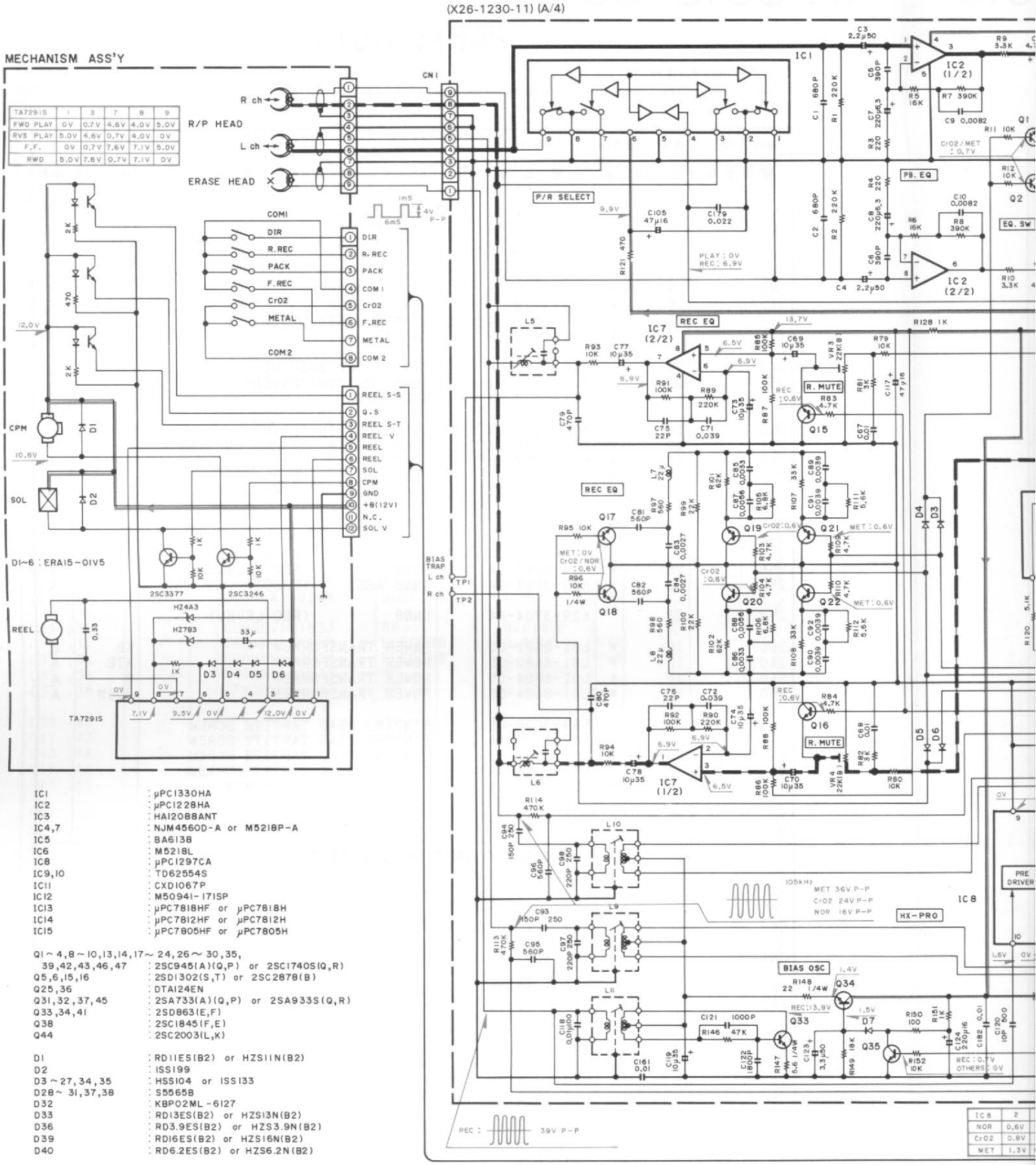
Refer to the schematic diagram for the values of resistors and capacitors.

Ref. No.		Address
IC	Q	
	1	4X
	2	3X
	3	4X
	4	3X
	5	2Z
	6	2Z
	8	3Z
	9	4Z
	10	4Z
	13	2Y
	14	3Y
	15	2W
	16	2V
	17	2X
	18	2V
	19	2W
	20	2V
	21	2W
	22	2V
	23	2Y
	24	3Y
	25	3Y
	26	5W
	27	3Y
	28	3Y
	29	3Y
	30	3Y
	31	2Y
	32	2W
	33	3W
	34	4V
	35	4U
	36	3Z
	37	5V
	38	5W
	39	4W
	40	4V
	41	5W
	42	5X
	43	5X
	44	5X
	45	5Y
	46	5W
	47	5W

Ref. No.		Address
IC	Q	
1		3X
2		3X
3		2X
4		3Z
5		4Z
6		2U
7		2W
8		3V
9		3U
10		3U
11		4V
12		5V
13		4Z
14		5Z
15		5X

Ref. No.		Address
IC	Q	
	1	4S
	2	5S
1		2S

(X26-1230-11) (A/4)

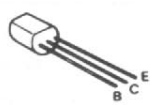


TA7291S	1	3	7	8	9
FWD PLAY	0V	0.7V	4.6V	4.0V	5.0V
RVS PLAY	5.0V	4.6V	0.7V	4.0V	0V
F.F.	0V	0.7V	7.6V	7.1V	5.0V
RWD	5.0V	7.6V	0.7V	7.1V	0V

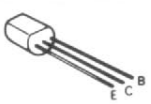
IC1	: μPC1330HA
IC2	: μPC1228HA
IC3	: HAI2088ANT
IC4,7	: NJM4560D-A or M5218P-A
IC5	: BA6138
IC6	: M5218L
IC8	: μPC1297CA
IC9,10	: TD62554S
IC11	: CXD1067P
IC12	: M50941-171SP
IC13	: μPC7818HF or μPC7818H
IC14	: μPC7812HF or μPC7812H
IC15	: μPC7805HF or μPC7805H
Q1~4,8~10,13,14,17~24,26~30,35, 39,42,43,46,47	: 2SC945(A)(Q,P) or 2SC1740S(Q,R)
Q5,6,15,16	: 2SD1302(S,T) or 2SC2878(B)
Q25,36	: DTA124EN
Q31,32,37,45	: 2SA733(A)(Q,P) or 2SA933S(Q,R)
Q33,34,41	: 2SD863(E,F)
Q38	: 2SC1845(F,E)
Q44	: 2SC2003(L,K)
D1	: RD11ES(B2) or HZS11N(B2)
D2	: 1SS199
D3~27,34,35	: HSS104 or 1SS133
D28~31,37,38	: S5565B
D32	: KBP02ML-6127
D33	: RD13ES(B2) or HZS13N(B2)
D36	: RD3.9ES(B2) or HZS3.9N(B2)
D39	: RD16ES(B2) or HZS16N(B2)
D40	: RD6.2ES(B2) or HZS6.2N(B2)

IC8	2
NOR	0.6V
CrO2	0.8V
MET	1.3V

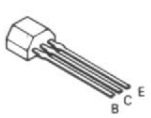
DTA124EN



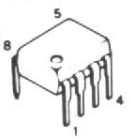
DTC124EN
2SA733(A)
2SC1845
2SC2003
2SC2878
2SC945(A)
2SD1302
2SD863



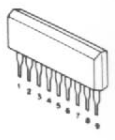
2SA933S
2SC1740S



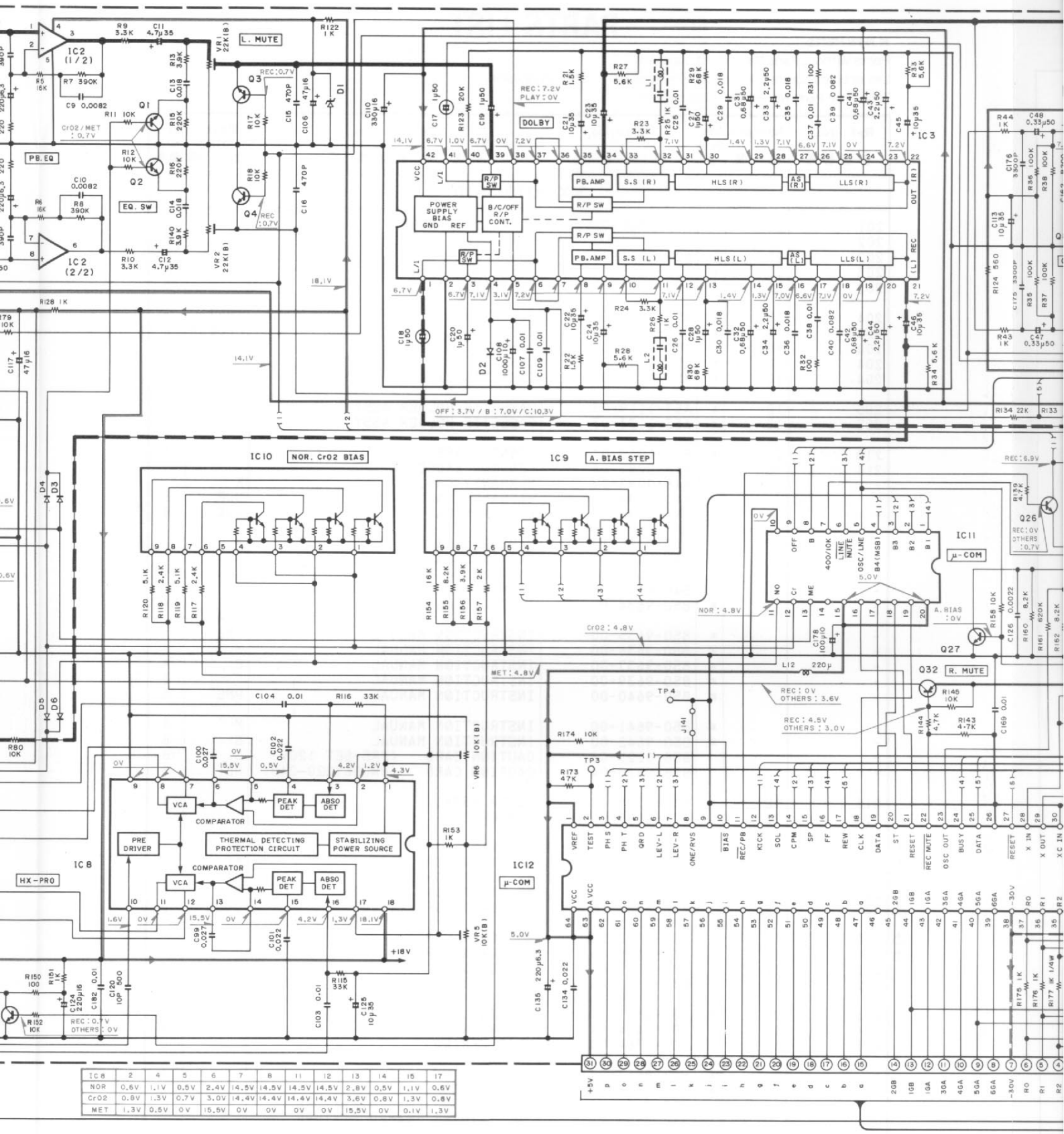
NJM4558D-A
NJM4560D-A



UPC1330HA

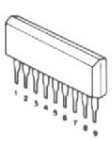


F G H I J

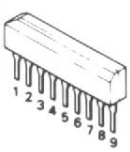


IC8	2	4	5	6	7	8	11	12	13	14	15	17
NOR	0.6V	1.1V	0.5V	2.4V	14.5V	14.5V	14.5V	14.5V	2.8V	0.5V	1.1V	0.6V
Cr02	0.8V	1.3V	0.7V	3.0V	14.4V	14.4V	14.4V	14.4V	3.6V	0.8V	1.3V	0.8V
MET	1.3V	0.5V	0V	15.5V	0V	0V	0V	0V	15.5V	0V	0.1V	1.3V

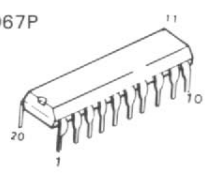
1330HA



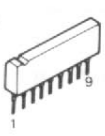
TD62554S



CXD1067P



BA6138

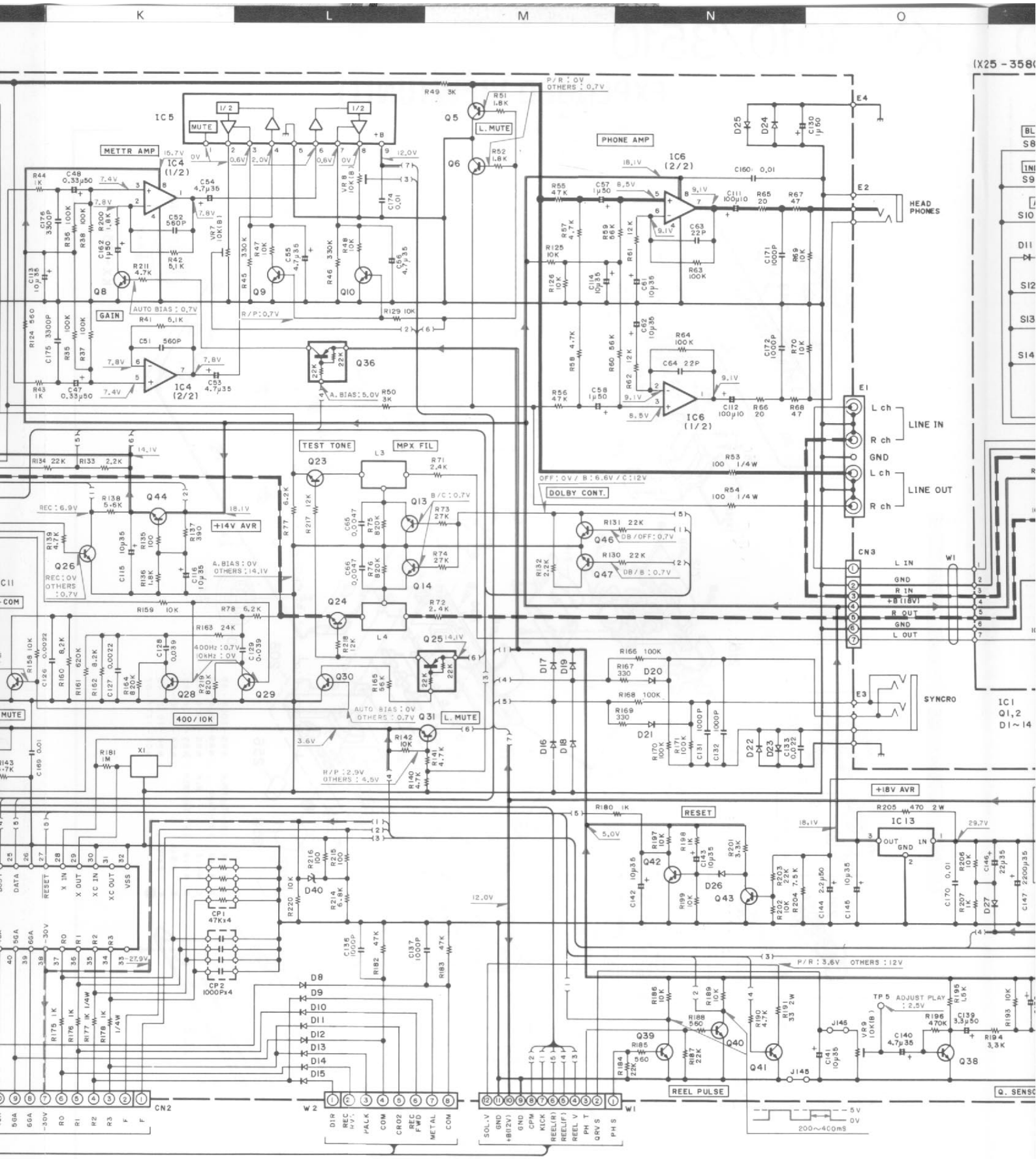


M5218P-A

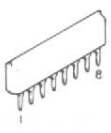
M5218L

UPC

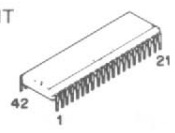
K L M N O



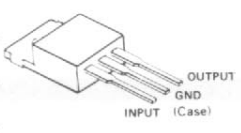
UPC1228HA



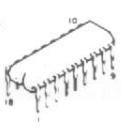
HA12088ANT



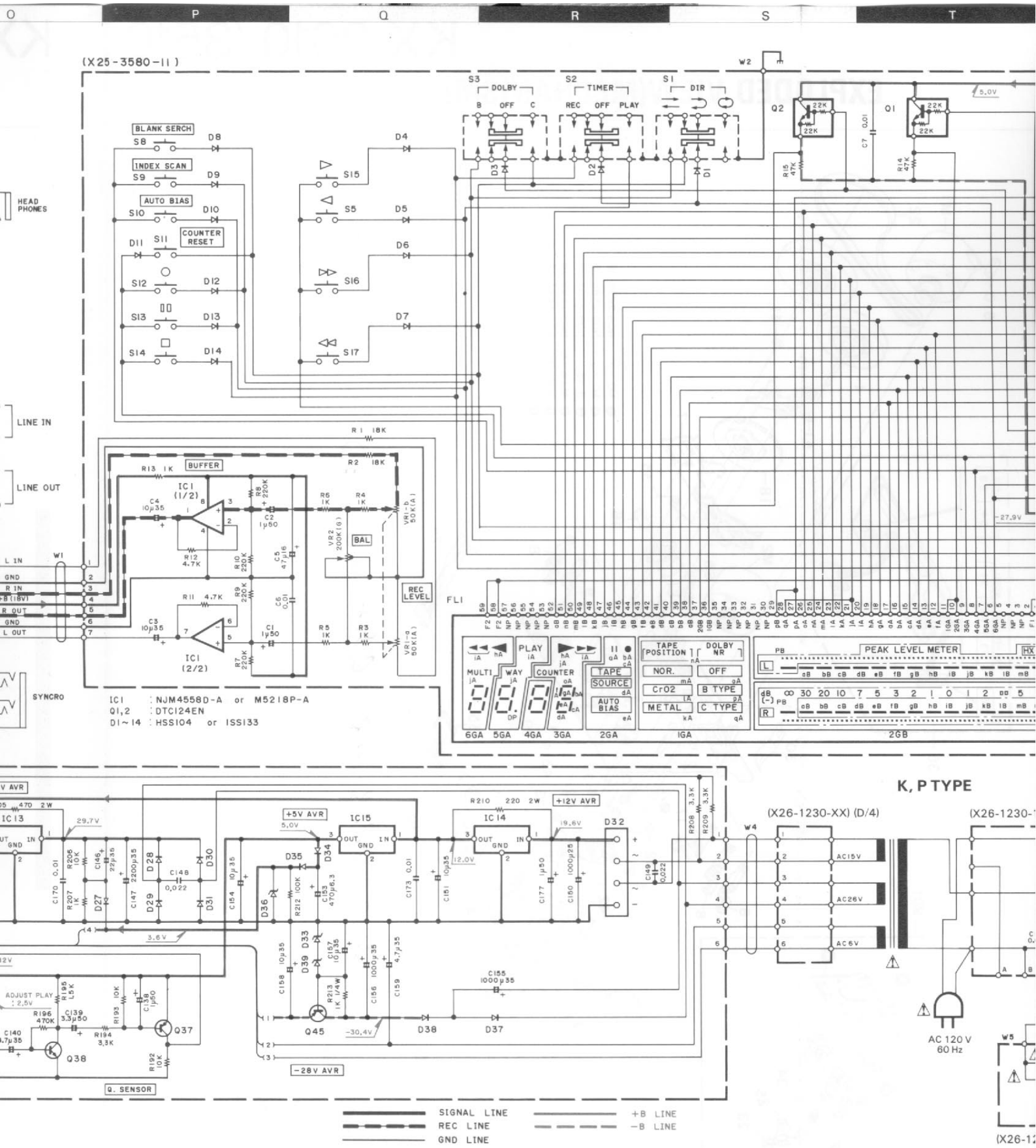
μPC7805H
μPC7805HF
μPC7812H
μPC7812HF
μPC7818H
μPC7818HF



μPC1297CA



M50941-171SP

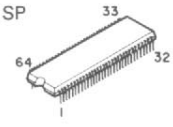


K, P TYPE

(X26-1230-XX) (D/4)

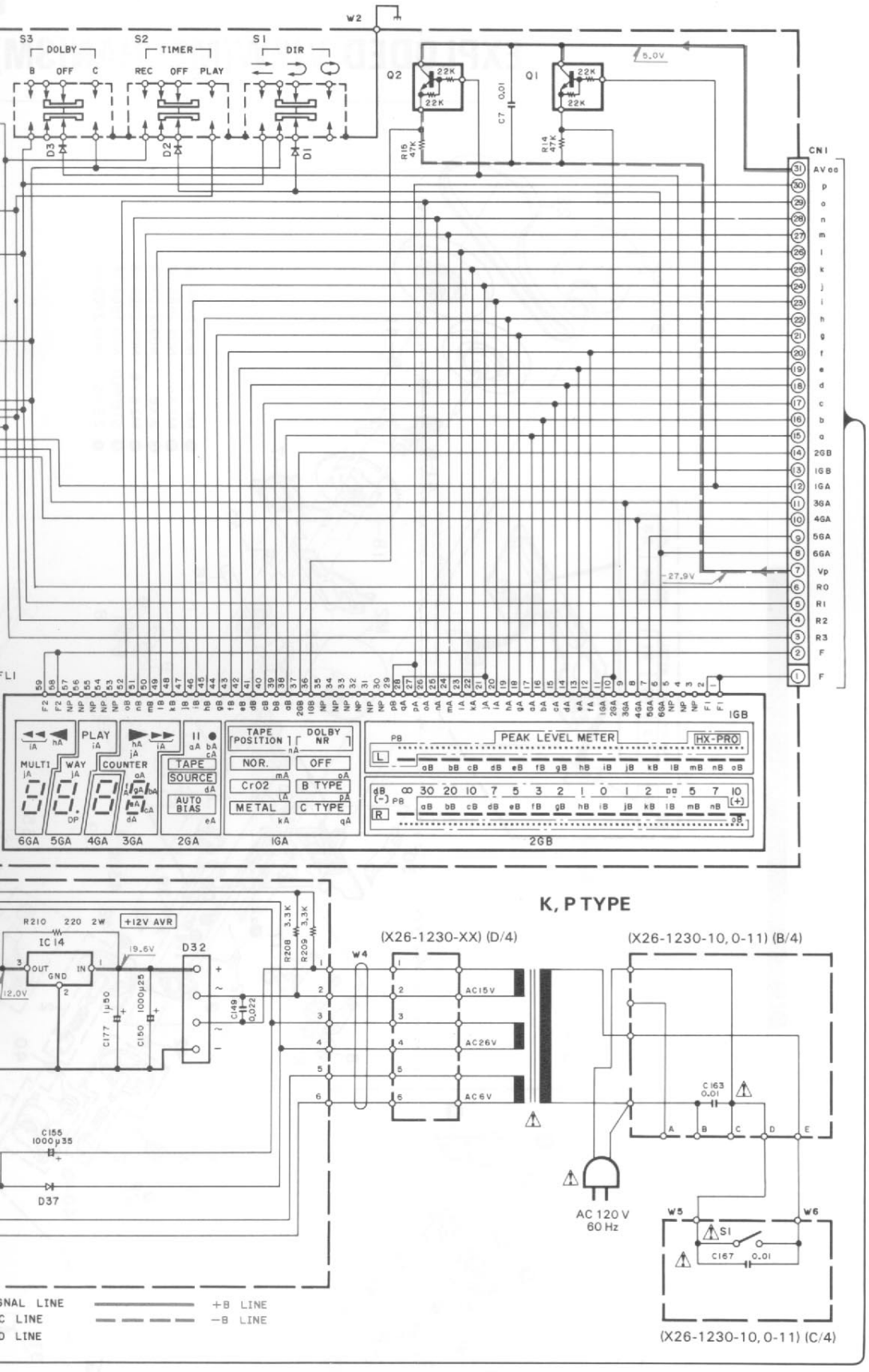
AC 120 V 60 Hz

M50941-171SP



CAUTION: For continued safety, replace safety critical components only with manufacturer's recommended parts (refer to parts list). ⚠ Indicates safety critical components. To reduce the risk of electric shock, leakage-current or resistance measurements shall be carried out (exposed parts are acceptably insulated from the supply circuit) before the appliance is returned to the customer.

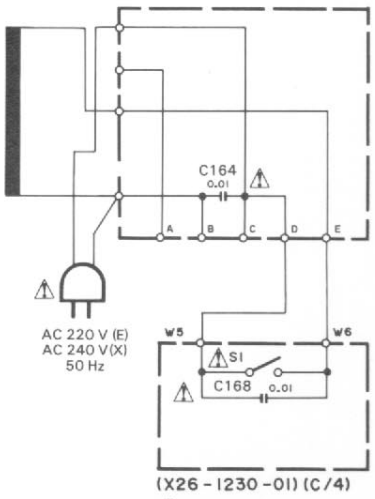
DC voltages are as measured with a high impedan ter with a cassette loaded at playback mode. Value slightly due to variations between individual i or/and units. Bias circuit DC voltages are as measur the record mode.



K, P TYPE

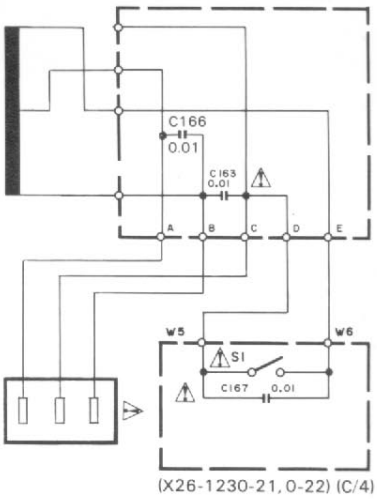
X, E TYPE

(X26-1232-71, 2-72) (B/4)



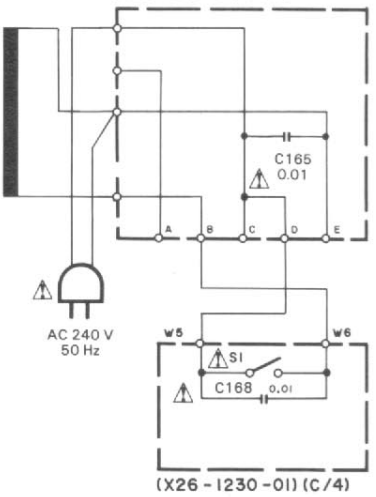
M, U, UE TYPE

(X26-1230-21, 0-22) (B/4)



T TYPE

(X26-1230-51, 0-52)



or continued safety, replace safety critical compo-
ith manufacturer's recommended parts (refer to
Indicates safety critical components. To reduce the
shock, leakage-current or resistance measurements
d out (exposed parts are acceptably insulated from
cuit) before the appliance is returned to the custom-

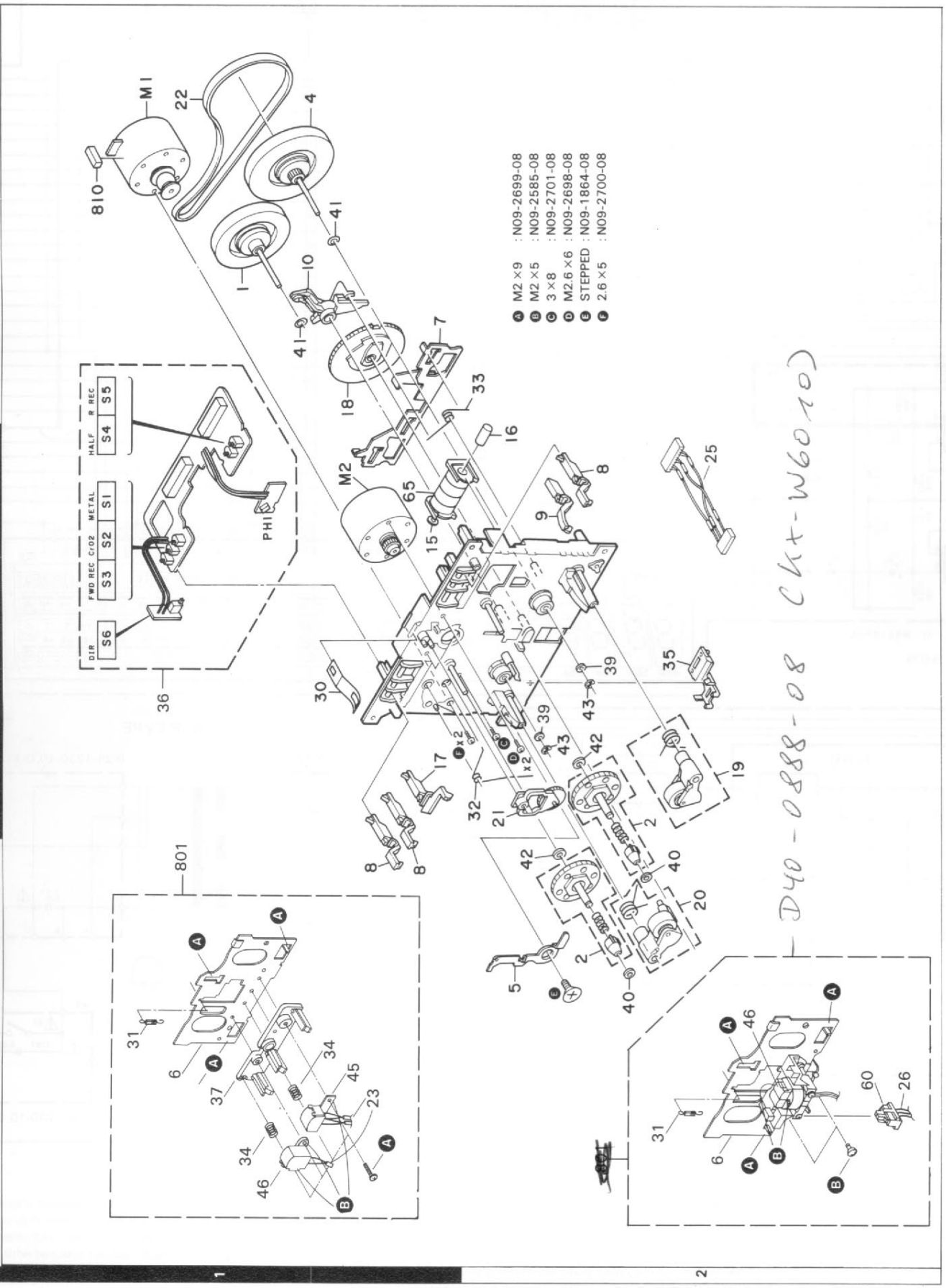
DC voltages are as measured with a high impedance voltmeter with a cassette loaded at playback mode. Values may vary slightly due to variations between individual instruments or/and units. Bias circuit DC voltages are as measured while in the record mode.

Y26-2960-10

KX-3010/3510

KENWOOD

EXPLODED VIEW(MECHANISM)

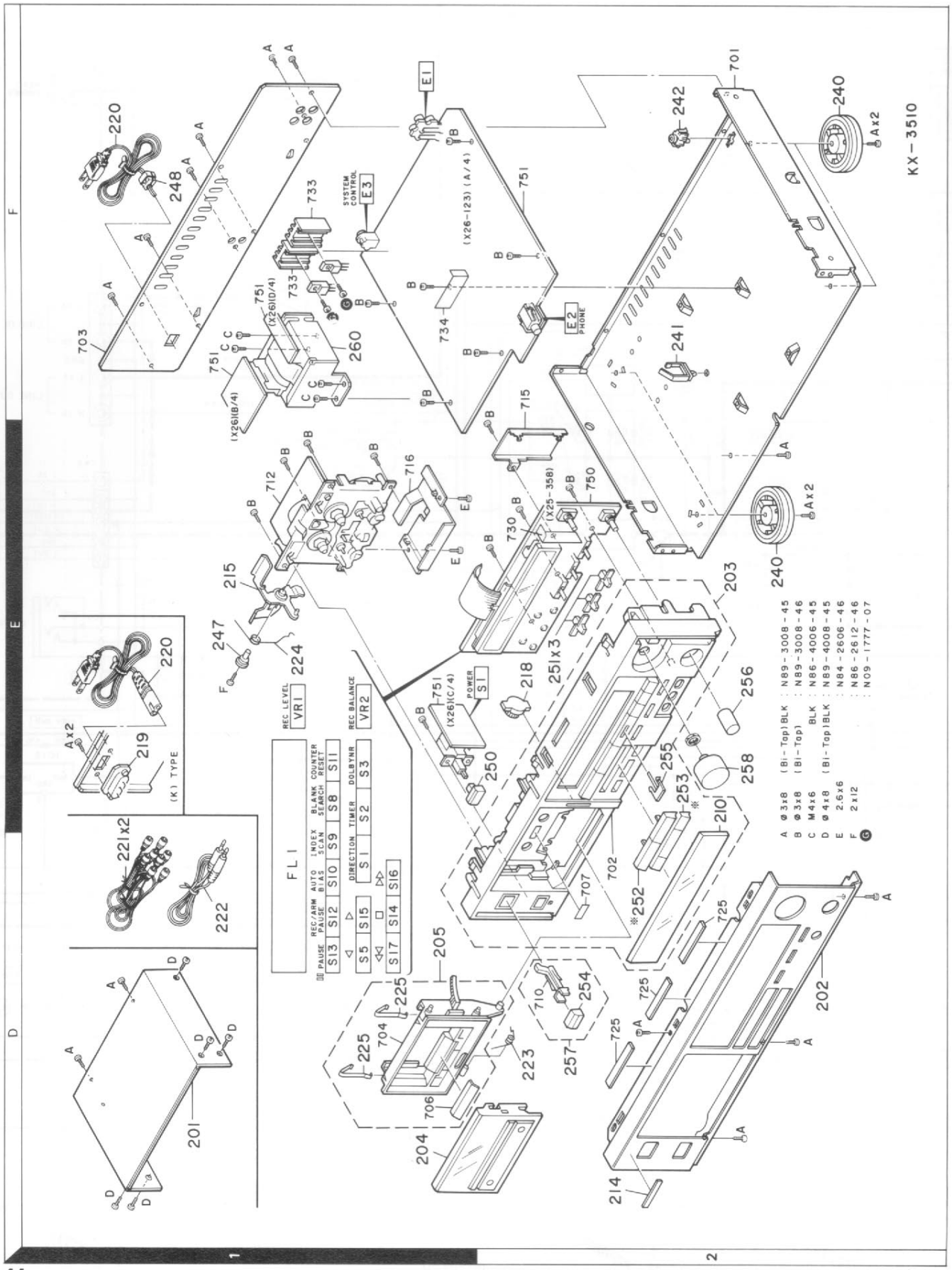


D40-0888-08 CVT-W60(10)

Parts with the exploded numbers larger than 700 are not supplied.

KX-3010/3510

EXPLODED VIEW (UNIT)



Parts with the exploded numbers larger than 700 are not supplied.